THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

TOWNSHIP OF SALTFLEET

COUNTY OF WENTWORTH

1965

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ONTARIO WATER
RESOURCES COMMISSION

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REPORT

ON A

WATER POLLUTION SURVEY

OF THE

TOWNSHIP OF SALTFLEET

County of Wentworth

1965

DIVISION OF SANITARY ENGINEERING

WATER POLLUTION SURVEY

INTRODUCTION

A water pollution survey was carried out in the Township of Saltfleet during the months of June and July, 1965. Such surveys are performed routinely, and upon request, by the Commission in an effort to locate and evaluate existing and potential sources of pollution.

The examination and sampling of local watercourses and sewer outfalls; a review of Commission files on sewage treatment and water supply works; and the results of interviews with local officials constitute the major portion of this report.

I GENERAL

The Township of Saltfleet is located in the Niagara Peninsula just east of the City of Hamilton and on the south shore of Lake Ontario. The municipality, according to the 1965 Municipal Directory, has a population of 17,276 and a taxable assessment of 22.2 million dollars. Industrial development has been slow but is now progressing in the western portions of the township. Lands that were once used largely for agriculture in the area north of the escarpment have been transformed into residential subdivisions. South of the escarpment, little change has taken place in recent years and land use is still primarily agricultural.

There are no police villages within the township. There are, however, a number of subdivision developments and smaller settlements. Among the latter are Fruitland, Tapleytown, Vinemount and Winona.

Drainage throughout the western and northern sections of the municipality is effected through Stoney Creek and a number of small ditches to Lake Ontario. Forty Mile Creek, in the southeast, drains in an easterly direction to its confluence with the lake at Grimsby.

II WATER USES

1. Municipal Water Systems

The majority of the built-up areas of the township are serviced by a municipal water supply system. Water is purchased by the township from both the City of Hamilton and the adjacent Township of North Grimsby. Within the past few months, the distribution system by which the E.D. Smith Company supplied a number of residences in the Winona area has been purchased by the municipality.

In all areas south of the escarpment and in some to the north, individual property owners are dependent on private wells as a source of supply. The majority provide water of satisfactory quality from a bacteriological standpoint. However, ground-water supplies on the escarpment or mountain are often of poor chemical quality, exhibiting excessive chlorides, sulphates and iron.

One area of the township is of special concern with respect to water supply. The Lucky Park subdivision, west of Highway 20, consists of approximately 80 dwellings, all dependent on individual wells and waste-disposal systems. The concentrated development of septic tank systems in the area has resulted in contamination of 80-90 per cent of the wells all of which are 25-30 feet deep. As a result, all homes are equipped with automatic chlorinating equipment and building permits for the subdivision are released only on proof of the purchase of a chlorinator prior to issuance. The development of a safe municipal or community supply in the area would be most desirable.

2. Private Water Systems

The OWRC has knowledge of two privately-operated water supplies, both located along the Lake Ontario shoreline to serve cottage developments. Details of the two systems are as follows:

McCollum Water Works

Owner - D.J. McCollum, Box 8, Winona
Number of Services - 22
Pump Capacity - 20 gpm
Storage Capacity - 200 gallons
Treatment - chlorination
Comments - the system is inspected and sampled regularly by both OWRC and health unit staff. All samples taken in 1963, 1964 and 1965 were bacteriologically satisfactory.

Morris Water Works

Owner - A. Morris, R.R.#2, Stoney Creek
Number of Services - 87
Source - infiltration wells near Lake Ontario
Pump Capacity - 6,000 gph
Storage Capacity - 500 gallons
Treatment - chlorination
Comments - this system is inspected and sampled regularly by the OWRC and the local health unit. Sample results have been satisfactory over the past 3 years.

The Commission has recommended in the past that the operators of both the systems assume greater responsibility in the matter of routine sampling of the water supplies. A minimum of two treated and one raw sample should be taken monthly for laboratory analysis.

3. Industrial Water Supplies

E.D. Smith and Sons Limited operate a private water supply system for their canning plant at Winona. Water is drawn from Lake Ontario and receives coarse screening, alum and chlorine treatment, and pressure filtration. Daily pumpage varies through the year with peak volumes during September and October in excess of 350,000 gpd. The system is inspected regularly by staff of the Commission and has at all times been found satisfactory.

As noted earlier, the supply of water to area residents from this source was discontinued earlier this year.

4. Recreational Uses

The township has approximately 6 miles of frontage on Lake Ontario. Swimming, boating, and fishing in the lake are popular summer pastimes. With the large number of minor watercourses which empty into the lake, the protection of these small ditches and creeks from pollution is essential to cottage owners on the shoreline.

5. Agricultural Use

There is no record of any surface water being used within the township for irrigation of crops. The intermittent nature of the local watercourses limits such use severely, although cattle may find occasional water holes. Forty Mile Creek at the eastern limits of the township has an occasionally heavy flow and would provide a moderate amount of water for agricultural uses.

III WATER POLLUTION

1. Sanitary Waste Disposal

(a) Existing Conditions

A small area in the vicinity of Grays Road, Greens Road and Highway 8 is serviced by municipal sanitary sewers by means of the Blenheim Trunk Sewer. The latter, in turn, discharges to a larger trunk sewer at the Queen Elizabeth Way, then to the City of Hamilton treatment works. A limited number of establishments are presently connected to the sanitary sewer systems.

Throughout the major portion of the municipality, the disposal of domestic and industrial wastes is left to the individual property owner. In most cases, this is accomplished by means of septic tanks and disposal beds. Heavy clay soil conditions throughout the township greatly restrict the effectiveness of such systems with the result that many fail to function properly. In nearly all areas, this failure is reflected by the presence of sewage in street ditches particularly in the built-up sections north of the escarpment.

Two subdivisions within the township have been provided with waste stabilization ponds or lagoons. These are the Bartlett (Gardendale) and Plateau Park developments, both located between Highway 8 and the escarpment. Each lagoon is designed to handle domestic wastes from approximately 50 homes. Both are of adequate size and have proved an effective method of treatment. A problem common to both, however, is the absence of an ideal receiving water course. This situation demands rigid control over the discharge of any lagoon contents. The contents must not be released except at times of spring runoff or when adequate dilution water is available in the receiving stream.

The only sewage treatment plant within the township serves the Winona District High School. The plant is a "Rated Aeration" package type designed to handle up to 1,200 students or 18,000 gallons per day. The present school population is approximately 800 and the present waste volume is estimated at 12,000 gpd. Difficulties have been experienced in the operation of the plant, due largely to improper or inadequate maintenance. The satisfactory operation of any treatment facility is dependent on the availability of a conscientious staff with a full understanding of the treatment process.

(b) Proposed Sewage Works

The municipality's long range plans for sanitary sewer development are largely confined to the western portions of the township adjacent to the Town of Stoney Creek. Extensions to the existing sewer system to serve the Bland Gardens and Brentwood Survey will be undertaken in the immediate future. This report confirms the need for sanitary sewer development on a broader scale as outlined in a Commission report prepared in 1959.

2. Industrial Waste Disposal

The disposal of industrial wastewaters within the township has resulted in several major problems. The following is a brief summary of the various concerns with which the OWRC staff has been involved.

E.D. Smith and Sons Ltd. - Winona

The firm is engaged in the processing of tomatoes and other fruits into ketchup, sauces, jams, jellies, and pie fillings. Process and sanitary wastes are discharged to one of the small ditches which empty into Lake Ontario. Screening is the only form of treatment.

While the plant operates year round, the major waste volumes occur during the period from mid-August to mid-December when tomatoes, peaches, and apples are processed. During the tomato season, a maximum volume of 1.1 million pounds of raw product has been processed on a single day. Average waste volumes and loading during this period have been calculated as 153,000 gpd and 2300 lb of BOD per day respectively. By comparison, a city of 13,000 persons would normally produce the same waste load.

Since 1956 the OWRC has urged the firm to proceed with suitable treatment facilities. At the present time, there is every indication that such facilities will be available prior to the 1966 canning season.

Stoney Creek Dairy

This firm processes in excess of 50,000 lb of raw milk per day into fluid milk products and ice cream. Average daily water consumption is 50-55 thousand gallons of which an estimated 80 per cent is discharged uncontaminated. The balance, representing process wastes, wash water and domestic sewage is discharged untreated to a municipal storm sewer which terminates in a drainage ditch.

The development of sanitary sewers in this area is part of the township's works programme. The operators of the firm have been promised a connection to the sewer at an early date.

Vinemount Quarries - Armstrong Bros. Construction Co. Ltd.

In the operation of a limestone quarry southeast of the hamlet of Vinemount, daily dewatering of the work areas has become necessary. Some 150-200 thousand gallons are pumped each day into a tributary of Forty Mile Creek. In a study just completed, it was found that the water removed from the quarry contains unusually high concentrations of natural salts. Farmers who extract water from the creek for irrigation of crops in the downstream sections have experienced damage to vegetation resulting from the high salt content. Since the normal dry weather flow in the creek is at an absolute minimum, the quarry water constitutes the major source of the stream.

Two additional firms, Highland Packers Ltd. and Dorr Bros. employ non-effluent-producing means of waste disposal, the former having all wastes removed by tank truck and the latter using a sub-surface tile bed for disposal of liquid wastes. Neither establishment is considered to be a significant source of pollution.

Additional industrial development is presently taking place within the township, a large portion of it in a fully serviced industrial park. It is to be hoped that all future development will be restricted to areas serviced by sanitary sewers.

3. Refuse Disposal

A landfill disposal site for the deposit of refuse is maintained by the township at Lot 12 Concession VI. The property is lightly wooded and adjacent to a small ditch, tributary to Forty Mile Creek. It is unlikely that any pollution of the watercourse originates at this source.

Since the present area is nearly exhausted, plans are underway to transfer the disposal area to an abandoned quarry at Lot 5 Concession V. An evaluation of the proposed site with respect to the possibility of potential contamination of ground water, would be advisable.

4. Discussion of Sample Analyses

Samples were secured from various ditches and sewer outlets throughout the township. The locations are indicated on the map which accompanies this report. The results of analyses performed by the OWRC laboratory are appended along with an appendix outlining their significance.

Samples numbered 1 through 5 reflect the presence of domestic sewage in street and drainage ditches adjacent to various subdivisions and commercial development in the municipality. The storm sewer outlet which discharges at point 1 receives wastes from Stoney Creek Dairy and North Side Plaza. Sample points 2 and 5 are located in or adjacent to the Brentwood Survey. Sample locations 6 and 7 reflect the effect of wastes from the E.D. Smith and Sons plant.

Samples secured at locations numbered 9 through 15 indicate that the pollution extends north to the Q.E. Way and eventually is deposited in the lake. While this survey did not include sampling in the lake, a county health unit survey conducted during the summer revealed that most of the beaches in the township were unfit for bathing.

IV SUMMARY AND CONCLUSIONS

A water pollution survey of the Township of Saltfleet was carried out during June and July. The results of field examinations and laboratory analyses of samples reveal that pollution of numerous watercourses by domestic and industrial wastes is widespread.

The pollution can be attributed to two interrelated causes; the lack of municipal sanitary sewers and the inadequacy or inefficiency of individual waste disposal systems. In view of the adverse soil conditions which prevail, little improvement can be expected on an individual basis. The only satisfactory and permanent solution is the development of sanitary sewers throughout the township. Such development is presently confined to the extreme western sections north of the escarpment.

While the pollution in ditches which results from malfunctioning disposal systems is in itself a serious health hazard, the contamination of ground water supplies from the same cause is equally important. The Lucky Park subdivision is so affected.

V RECOMMENDATIONS

1. Consideration should be given to the provision of a municipal or community water supply to the Lucky Park

residential development.

2. Suitable waste treatment facilities should be provided to serve the E.D. Smith and Sons Limited plant at Winona.
3. The municipality should continue its program of pollution abatement through the provision of sanitary sewers to serve all built-up areas.

All of which is respectfully submitted.

Acting District Engineer: G H Mills
G.H. Mills

Approved by: ____________________
J.R. Barr, Director
Division of Sanitary Engineering.

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TABLE 1

TOWNSHIP OF SALTFLEET

No.	Location	Date	5-Day BOD (ppm)	Solids Total (ppm)	Solids Susp. (ppm)	Solids Diss. (ppm)	M.F. Coliform per 100 ml	Phenols (ppb)
1A	Ditch Drain - Rear of North Side Plaza	March 15/65	120	680	88	592	400,000	
1B	Ditch Drain - Rear of North Side Plaza	June 22/65	260	632	114	518	9,000,000	
1C	Ditch Drain - Rear of North Side Plaza	July 22/65	280	522	82	440	26,000,000	
2A	Ditch Drain - Grays Road - South of King St.	June 22/65	39	1172	112	1066	70,000,000	
2B	Ditch Drain - Grays Road - South of King St.	July 22/65	77	1500	69	1431	16,000,000	
3A	Ditch Drain - Dunsmure Rd. - East of Durham Road	June 22/65	68	854	152	702	14,000,000	
3B	Ditch Drain - Dunsmure Rd. - East of Durham Road	July 22/65	35	1608	41	1567	58,000,000	
4A	Street Ditch - Millen Road - South of Barton St.	June 22/65	145	1220	372	848	110,000,000	
4B	Street Ditch - Millen Road - South of Barton St.	July 22/65	38	1304	234	1070	16,000,000	
5A	Street Ditch - Terrace Drive - Brentwood Survey	June 22/65	200	1176	606	570	17,000,000	
6A	Ditch Drain - Barton St. - Between Glover & McNeilly	June 22/65	57	318	30	288		15
6B	Ditch Drain - Barton St. - Between Glover & McNeilly	July 22/65	1400	1604	132	1472	44,000,000	
7	Ditch Drain - Lakeview Cres. - West of McNeilly	June 22/65	30	400	31	369	5,700,000	
8	Ditch Drain - Rear of Winona High School	July 23/65	120	540	84	456	13,000,000	

TABLE 1 Cont'd.

TOWNSHIP OF SALTFLEET

No.	Location	Date	5-Day BOD (ppm)	Solids Total (ppm)	Solids Susp. (ppm)	Solids Diss. (ppm)	M.F. Coliform per 100 ml	Phenols (ppb)
9A	Ditch Drain - Church St.	July 22/65	5.2	726	9	717	13,000	
9B	Ditch Drain - Church St.	Aug. 25/65	2.8	1554	66	1488	-	
10	Ditch Drain at Q.E.Way - East of Grays Road	March 15/65	3.8	686	4	682	14,000	
11	Ditch Drain at Q.E.Way - East of Lake St.	March 15/65	1.3	860	4	856	920	
12	Ditch Drain at Q.E.Way - East of Lake St.	March 15/65	2.7	390	30	360	820	
13	Ditch Drain at Q.E.Way - at Green Road	March 15/65	2.3	582	12	570	54,000	
14	Ditch Drain at Q.E.Way - at Belgraden	March 15/65	2.9	786	23	763	36,000	
15	Ditch Drain at Q.E.Way - East of Dewitt Road	March 15/65	3.1	570	30	540	51,000	

APPENDIX

EXPLANATION AND SIGNIFICANCE OF LABORATORY ANALYSES

ALL THE LABORATORY TESTS INCLUDED IN THIS REPORT WERE PERFORMED AT THE ONTARIO WATER RESOURCES COMMISSION LABORATORY IN TORONTO.

A. BACTERIOLOGICAL EXAMINATION

THE MEMBRANE FILTER TECHNIQUE IS USED TO OBTAIN A DIRECT ENUMERATION OF COLIFORM ORGANISMS. THESE ORGANISMS ARE NORMAL INHABITANTS OF THE INTESTINES OF MAN AND OTHER WARM-BLOODED ANIMALS. THEY ARE ALWAYS PRESENT IN LARGE NUMBERS IN SEWAGE AND ARE GENERALLY MINIMAL IN OTHER WATER POLLUTANTS.

THE RESULTS OF THE EXAMINATIONS ARE REPORTED AS "M.F. COLIFORM COUNT PER 100 ML".

THE COMMISSION'S OBJECTIVE FOR STREAM SANITATION IS A COLIFORM DENSITY OF NOT GREATER THAN 2,400 ORGANISMS PER 100 ML.

B. SANITARY CHEMICAL ANALYSES

BIOCHEMICAL OXYGEN DEMAND (BOD):

BIOCHEMICAL OXYGEN DEMAND IS REPORTED IN PARTS PER MILLION (PPM), AND IS AN INDICATION OF THE AMOUNT OF OXYGEN REQUIRED FOR THE STABILIZATION OF DECOMPOSABLE ORGANIC MATTER IN THE WATER. THE COMPLETION OF THE LABORATORY TEST REQUIRES FIVE DAYS, UNDER THE CONTROLLED INCUBATION TEMPERATURE OF 20°C.

THE COMMISSION OBJECTIVE FOR STREAM WATER QUALITY IS AN UPPER LIMIT OF 4 PPM.

SOLIDS:

THE VALUE FOR TOTAL SOLIDS, EXPRESSED IN PARTS PER MILLION (PPM), IS THE SUM OF THE VALUES FOR THE SUSPENDED AND THE DISSOLVED MATTER IN THE WATER. THE CONCENTRATION OF SUSPENDED SOLIDS IS GENERALLY THE MOST SIGNIFICANT OF THE SOLIDS ANALYSES IN REGARD TO STREAM WATER QUALITY.

THE EFFECTS OF SUSPENDED SOLIDS IN WATER ARE REFLECTED IN DIFFICULTIES ASSOCIATED WITH WATER PURIFICATION, DEPOSITIONS IN STREAMS, AND INJURY TO THE HABITAT OF FISH.

WHERE SUSPENDED SOLIDS VALUES ARE LESS THAN 20 PPM LABORATORY DIFFICULTIES ARE EXPERIENCED AND THE TURBIDITY IS DETERMINED INSTEAD.

TURBIDITY:

TURBIDITY IS CAUSED BY THE PRESENCE OF SUSPENDED MATTER, SUCH AS CLAY, SILT, FINELY DIVIDED ORGANIC MATTER, PLANKTON AND OTHER MICROSCOPIC ORGANISMS IN WATER. IT IS AN EXPRESSION OF THE OPTICAL PROPERTY OF A SAMPLE AND RESULTS ARE REPORTED IN "SILICA UNITS".